Anatomy-5

Radius/Ulna

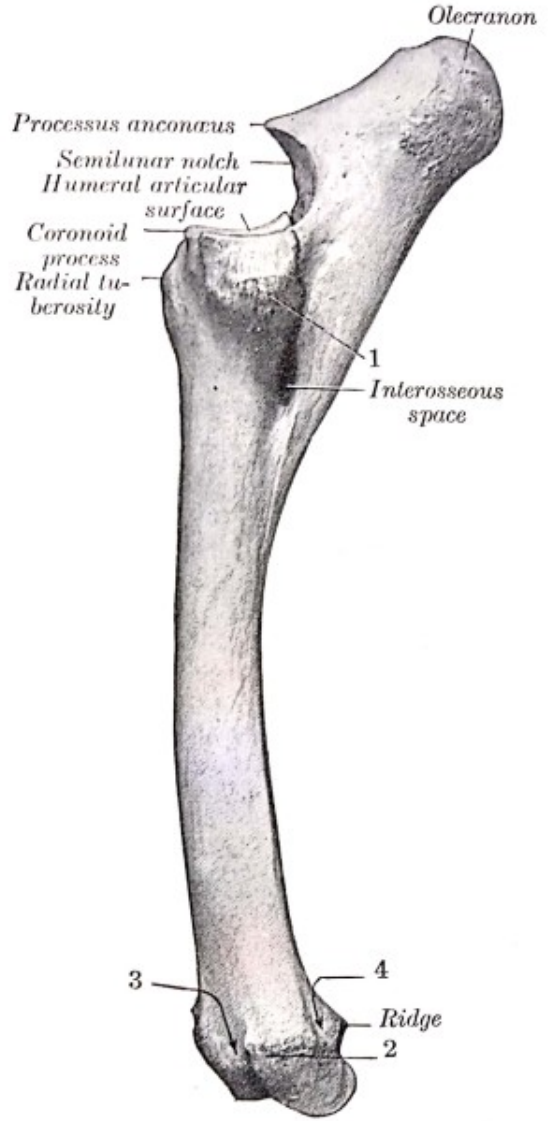
Carpus

Radius/Ulna (Horse)-1

- The two bones are fused, so all movement is in a sagittal plane, with very little pronation and supination

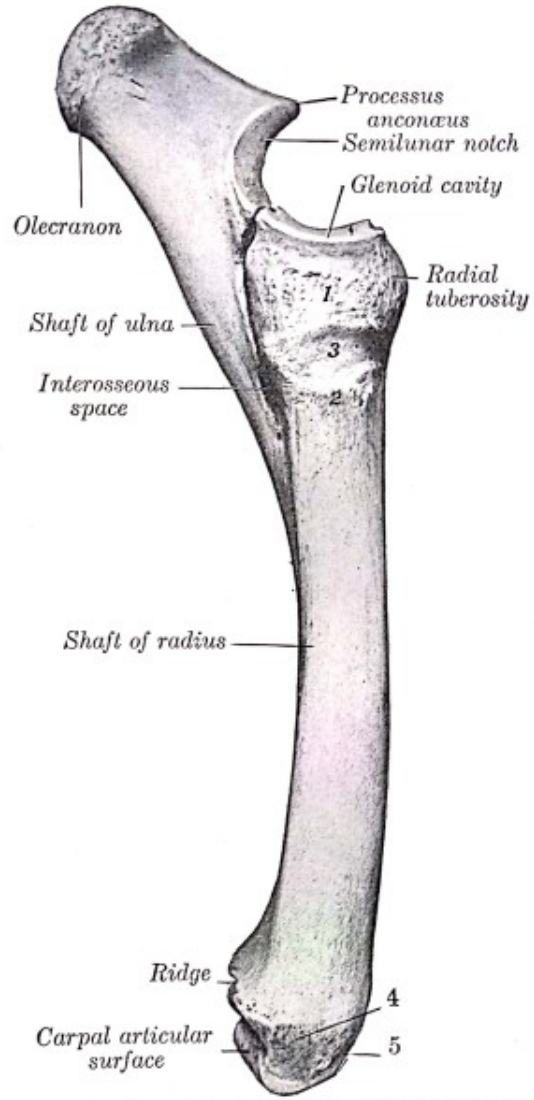
Radius/Ulna (Horse)-2

- The fusion of the two bones is interrupted by *interosseous space (foramen)* in the proximal third of antebrachium, which serves as a passage for blood vessels.



—Left Radius and Ulna of Horse; Lateral View.

1, Tuberosity for attachment of lateral ligament of elbow joint, and common and lateral extensor muscles; 2, tuberosity for attachment of lateral ligament of carpal joint; 3, groove for common extensor tendon; 4, groove for lateral extensor tendon.



—Left Radius and Ulna of Horse; Medial View.

1, Tuberosity for attachment of short part of medial ligament of elbow; 2, prominence for long part of same; 3, groove for end of brachialis muscle; 4, tuberosity for attachment of medial ligament of carpal joint; 5, oblique groove for tendon of extensor carpi obliquus.

Radius (Horse)-1

Proximal Extremity (Head):

- **Humeral articular surface;** corresponds to distal end of humerus and is crossed by a sagittal ridge
- **Just distal to caudal border;** two concave facets for articulation with ulna

Radius (Horse)-2

- **Lateral tuberosity;** gives attachment to lateral collateral ligament of elbow and common and lateral digital extensor muscles
- **Radial tuberosity** at medio-dorsal surface; serves for insertion of biceps brachii tendon
- **Medial tuberosity;** continuous with radial tuberosity and gives attachment to short medial ligament of the elbow joint

Radius (Horse)-3

Distal Extremity (Trochlea):

- Presents carpal articular surface
- **Cranial surface** presents three shallow grooves;
  - *Lateral groove* – gives passage to common digital extensor tendon
  - *Middle groove* - gives passage to extensor carpi radialis

Radius (Horse)-4

- *Medial groove* – gives passage to long digital abductor muscle
- **Caudal surface** – presents a small vertical groove for lateral digital extensor tendon

Radius (Horse)-5

- At the distal end; are the medial and lateral *styloid processes*
- The lateral styloid process of the radius is in fact, developmentally, the distal end of the ulna.

Radius (Horse)-6

Shaft:

- Flattened craniocaudally
- *Two surfaces* (Cranial and Caudal)
- *Two borders* (lateral and Medial)

Radius (Horse)-6

- *Cranial/Dorsal surface; smooth and slightly convex*
- *Caudal/Volar surface ;* proximal part has a shallow groove which concurs with ulna to form interosseous space
- *Medial border* – a smooth area for insertion of brachial tendon
- *Lateral border* – no special features

Ulna (Horse)-1

- Reduced long bone
- Caudal to the radius and partially fused with it in the adult

Ulna (Horse)-2

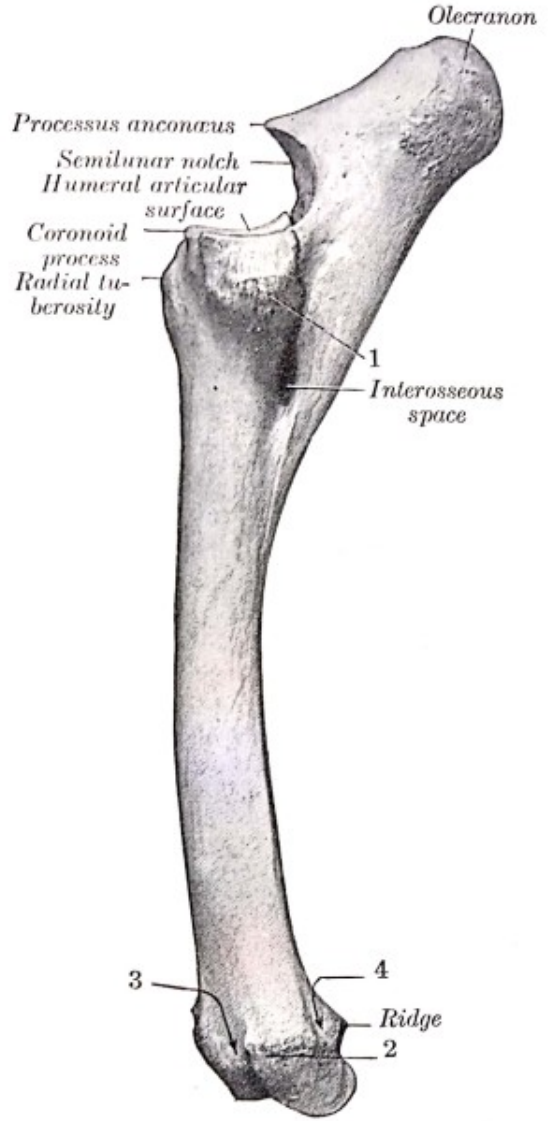
Shaft:

- Three sided and tapers to a point distally
- Rough proximal to the interosseous space and is attached to the radius by interosseous ligament
- *Lateral and medial borders;* thin and sharp

Ulna (Horse)-3

Proximal Extremity (Olecranon):

- Projects proximally caudal to the distal end of humerus and forms a lever for extensor muscles of the elbow
- Cranial border bears a pointed projection; the *"anconeal process or beak"* which overhangs the trochlear notch and fits within the olecranon fossa of the humerus during elbow extension



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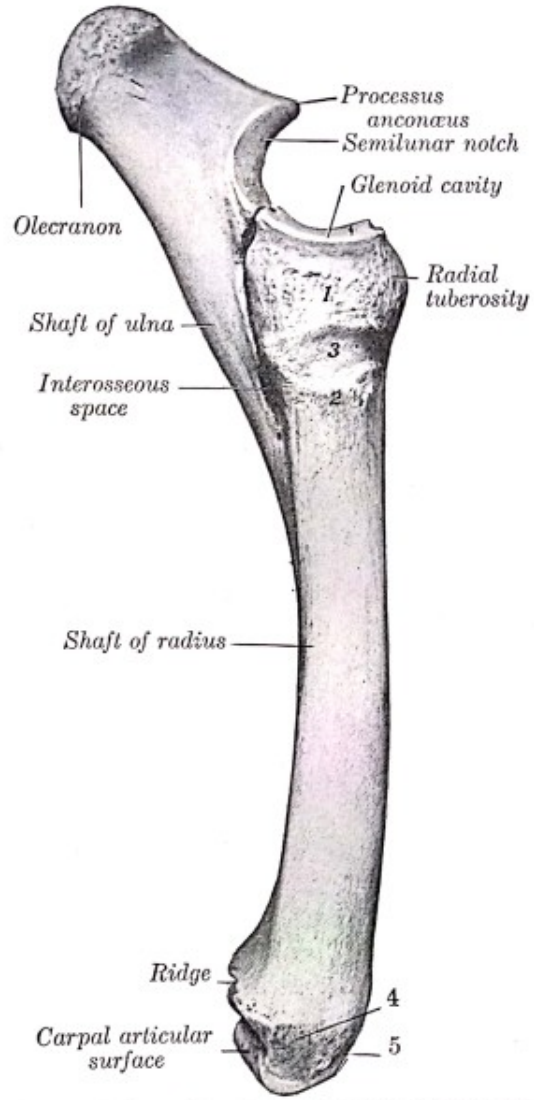

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Ulna (Horse)-4

- The trochlear notch articulates with the humerus
- Just distal to the notch there are two convex facets *(lateral and medial coronoid processes)* which have their counterparts on the caudal aspect of the radial head

Olecranon tuberosity
Olecranon
Anconeal process
Trochlear notch
Medial coronoid process
Lateral coronoid process
Radial notch
Body of ulna

Ulna (Horse)-5

- The free end or summit is a rough tuberosity *(the olecranon)* that serves as insertion for the triceps brachii, tensor fasciae antebrachii and anconeus muscles

Radius (Ox)-1

Radius:

- Short and relatively broad
- Has two extremities and a shaft

Shaft:

- Prismatic in the middle and has dorsal, volar and lateral surfaces

Radius (Ox)-2

Proximal Extremity:

- Articular surface has a synovial fossa between two glenoid cavities
- Radial tuberosity is represented by a slightly elevated rough area
- The facets for ulna are larger

Radius (Ox)-3

Distal Extremity:

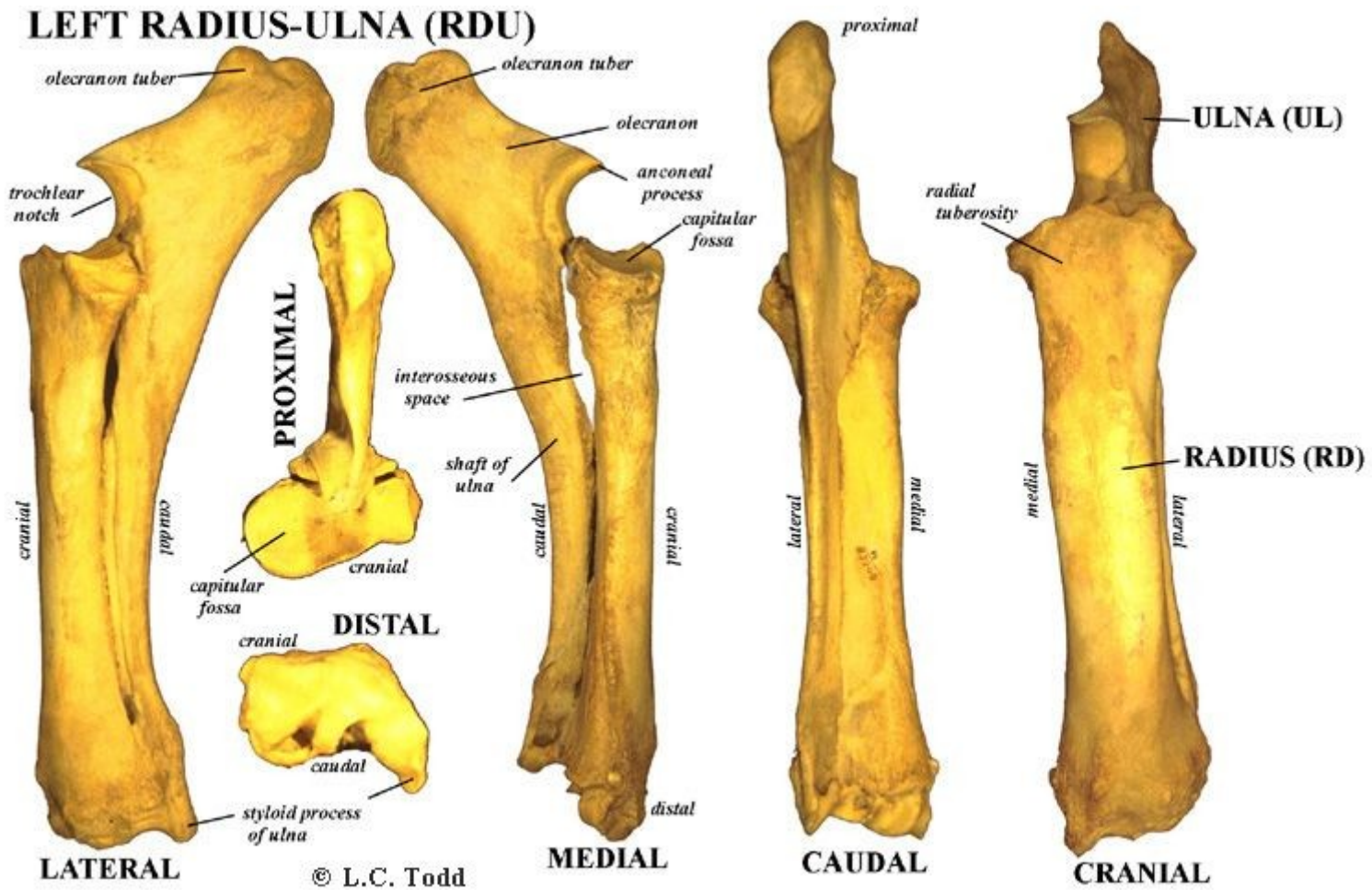
- Large and thickest medially
- Articular surface is oblique in two directions (from within upward and backward)
- Grooves for the extensor tendons are shallow

Ulna (Ox)-1

- Shaft is complete, three sided and strongly curved
- Olecranon is large and has a rounded tuberosity
- Distal end projects below the level of radius and forms the styloid process

Radius / Ulna (Ox)-1

- There are two interosseous spaces (proximal and distal); elsewhere the bones are fused
- A groove connects the two interosseous spaces laterally



Radius / Ulna (Ox)

Radius (Dog)-1

Shaft:

- Flattened from before backward
- Shaft forms two curves, convex dorsally and medially
- Dorsal surface has a groove in its distal half for oblique extensor of the carpus

Radius (Dog)-2

Proximal Extremity:

- Small and is supported by a distinct neck
- Has a concave area for articulation with the humerus and a convex area behind for ulna
- Radial tuberosity is small
- Lateral tuberosity is large

Radius (Dog)-3

Distal Extremity:

- Much wider
- Carpal articular surface is extensive & concave
- Medial border projects down to form styloid process
- Dorsally three grooves for extensor tendons

Ulna (Dog)-1

- Well developed
- Crosses volar surface of radius medio-laterally

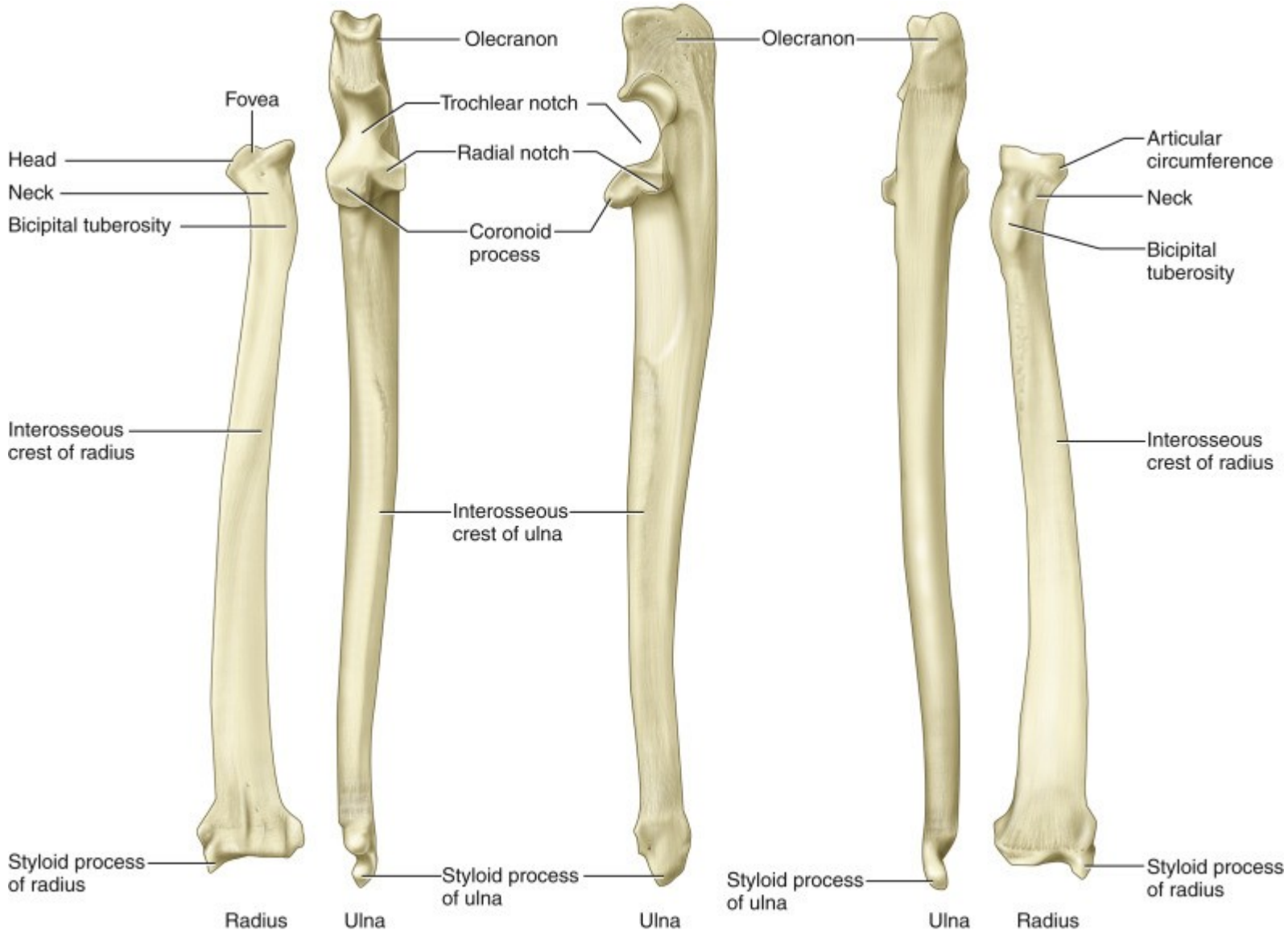
Proximal Extremity:

- Olecranon is grooved and bears three prominences; of which posterior one is large and rounded
- Semilunar notch is wider below

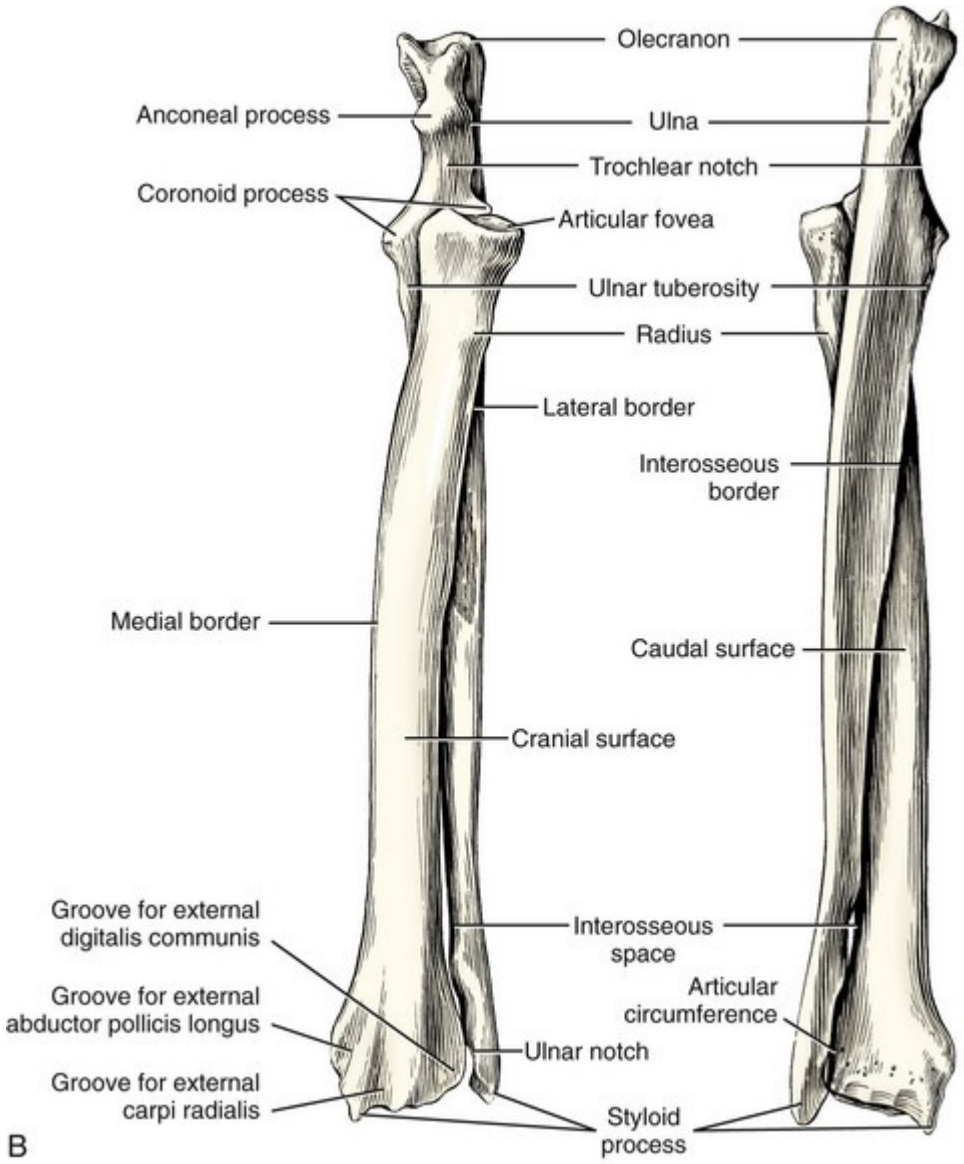
Ulna (Dog)-2

Distal Extremity:

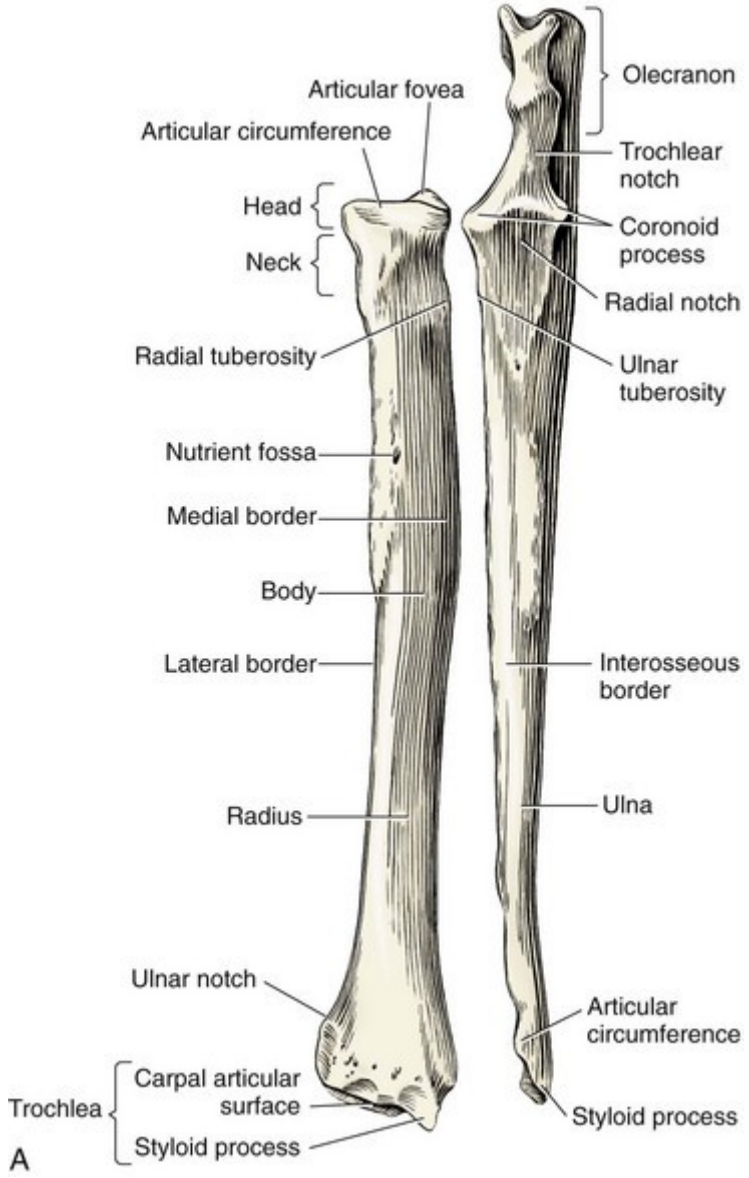
- Small and has a blunt point (styloid process)
- Articulates with the ulnar carpal and has a convex facet on its dorso-medial aspect for the radius



(a) Left radius and ulna, anterior view (b) Left ulna, lateral view (c) Left ulna and radius, posterior view



Radius and Ulna (Dog)



Radius and Ulna (Dog)

RADIUS and ULNA

Sr. No	POINTS	Horse	Ox	Dog
1	ULNA	REDUCED	COMPLETE	COMPLETE
2	LATERAL STYLOID PROCESS	SUPPOSED TO BE DISTAL END OF ULNA	FORMED BY DISTAL END OF ULNA	FORMED BY DISTAL END OF ULNA
3	MUSCULAR GROOVE	DEEP	SHALLOW	SHALLOW
4	TROCHLEAR NOTCH	LESS PROMINENT	MORE PROMINENT	WELL DEVELOPED

Carpal Bones (Horse)-1

Carpal bones comprise two rows:

1. Proximal row (medial to lateral):

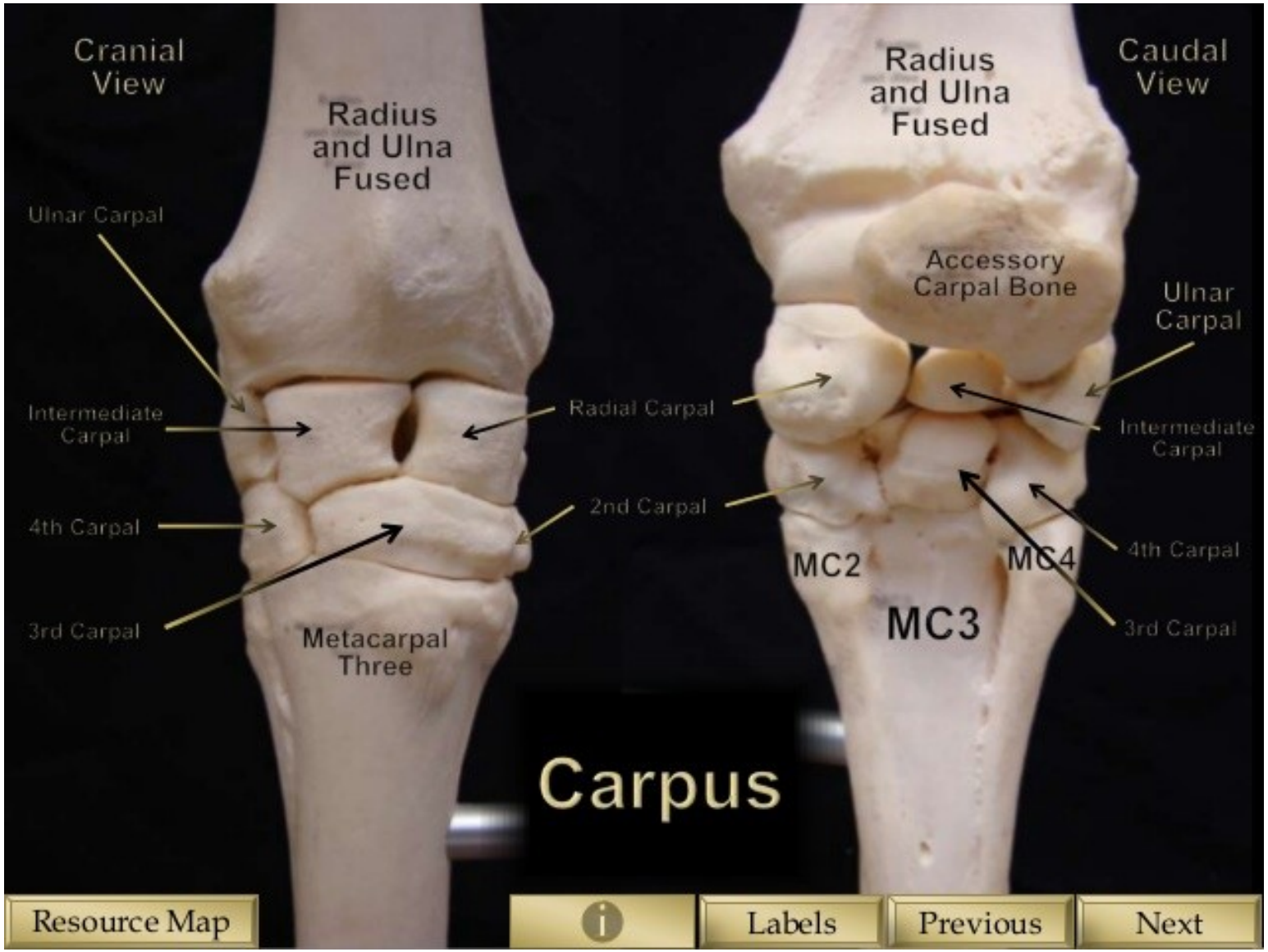
- Radial Carpal
- Intermediate Carpal
- Ulnar Carpal and
- Accessory carpal

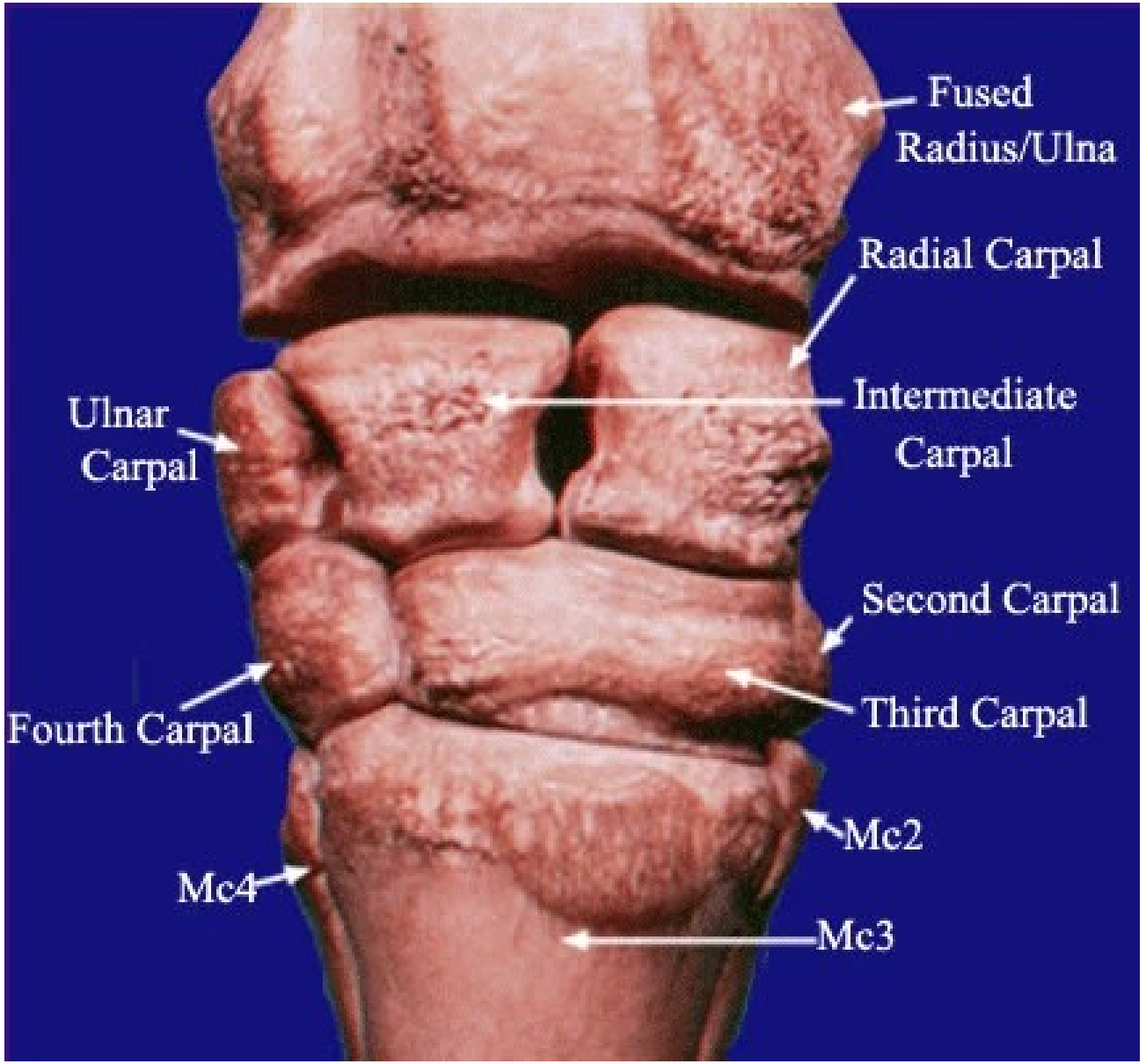
Carpal Bones (Horse)-2

2. Distal row:

- Numbered; *first to fourth carpal bones*
- *The first is small or may be absent*

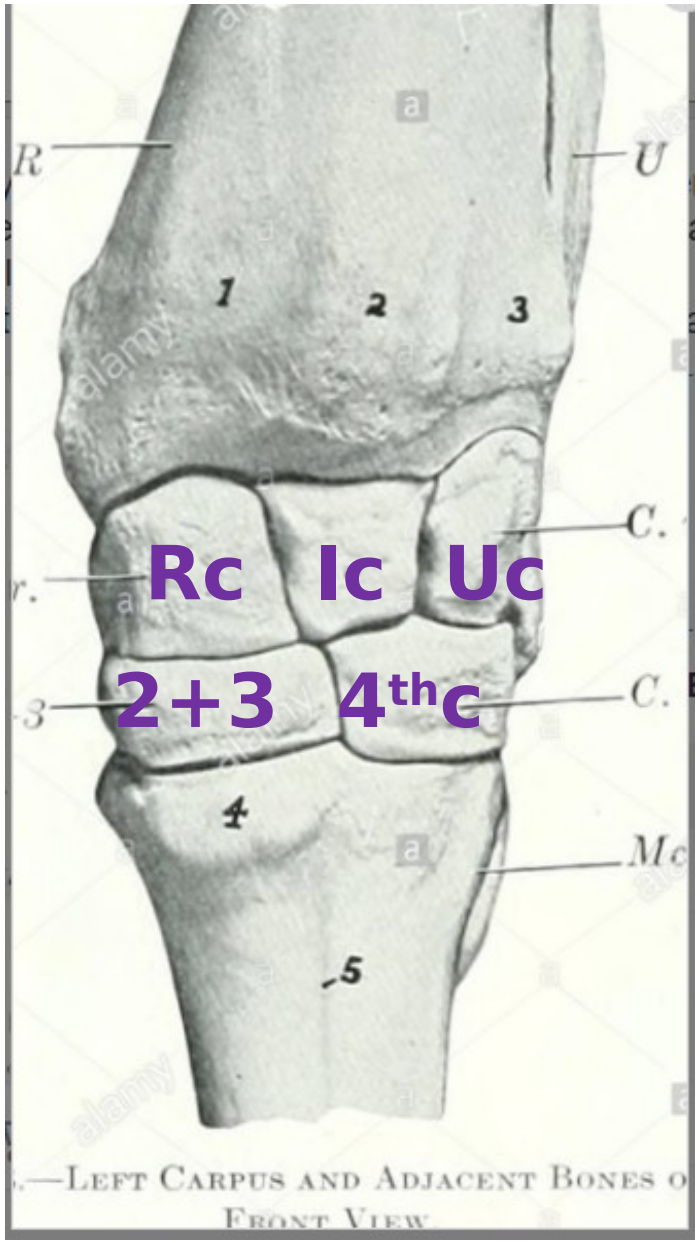
Note: The details of the joint will be covered in arthrology


Cranial View
Radius and Ulna Fused
Ulnar Carpal
Intermediate Carpal
4th Carpal
3rd Carpal
Metacarpal Three
Radial Carpal
2nd Carpal
Radius and Ulna Fused
Caudal View
Accessory Carpal Bone
Ulnar Carpal
Intermediate Carpal
4th Carpal
3rd Carpal
MC2
MC4
MC3
Carpus
Resource Map
Labels
Previous
Next


Fused
Radius/Ulna
Radial Carpal
Intermediate
Carpal
Ulnar
Carpal
Second Carpal
Third Carpal
Fourth Carpal
Mc2
Mc4
Mc3

Carpus (Ox)-1

- Six bones
- Four in proximal row (Rc, Ic, Uc, Ac)
- Two in distal row
  - 1st absent
  - 2nd and 3rd are fused to form a quadrilateral bone
  - 4th is smaller and quadrilateral

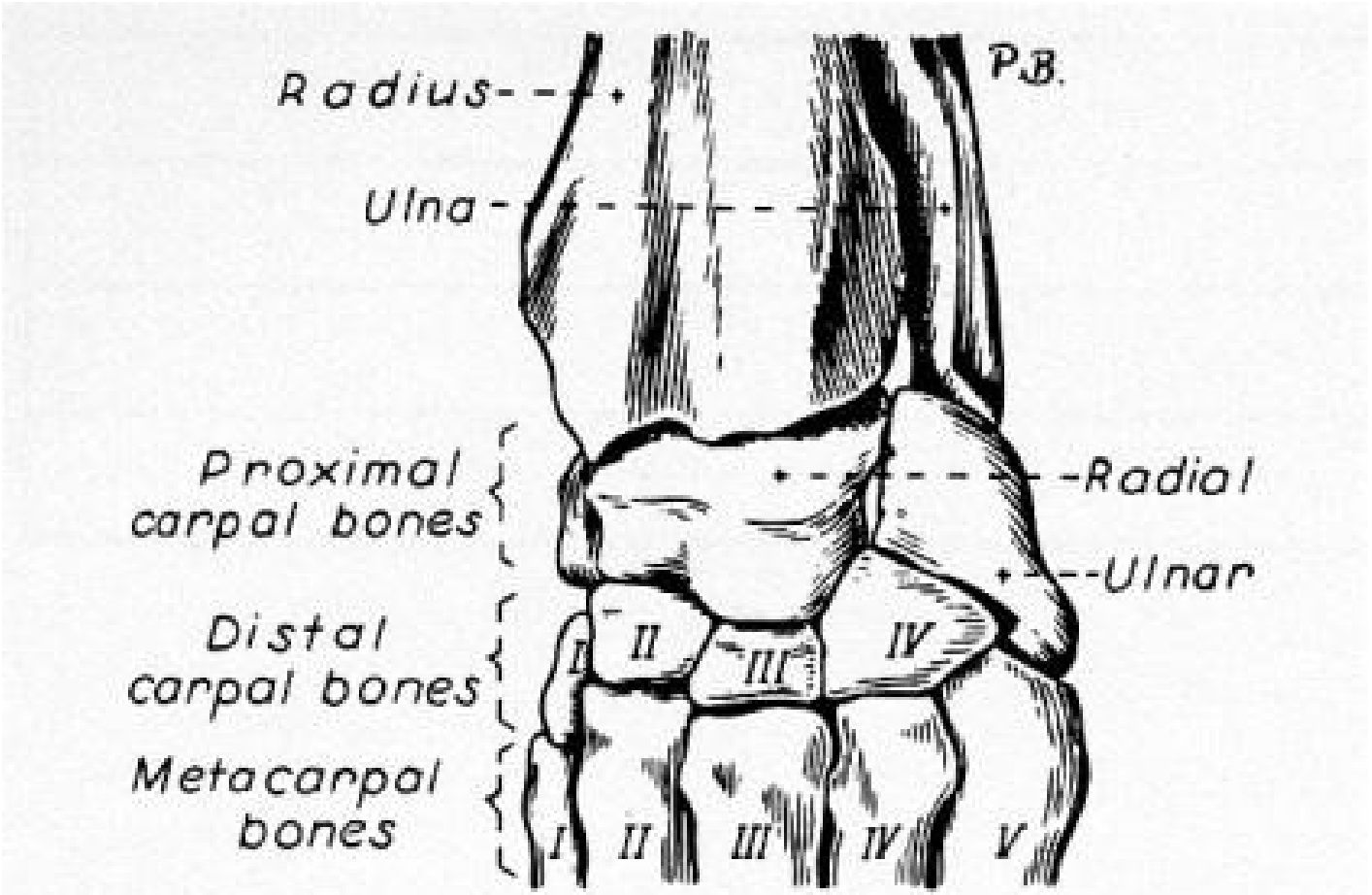


Left Carpus (Ox) Frontal View

Carpus (Dog)-1

Seven bones:

- Three in proximal row
  - Radial or Radio-intermediate
  - Ulnar
  - Accessory
- Four in distal row (1st, 2nd, 3rd, 4th)



Left carpus, articulated, dorsal aspect. (Evans HE, Christenson GC: Miller's Anatomy of the Dog. Philadelphia, WB Saunders, 1979)